Air Products and Chemicals, Inc.
Box 538, Allentown, PA 18105
Tel. (215)481-4911 • TWX 510-651-3686
CABLE-AIRPROD • TELEX 84-7416

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DPM 154-1

Nitrogen Material Safety Data Sheet

Air Products

Industrial Gas Division

	TRADE NAME AND SYNONYMS	Nitrogen, LIN (Liquid only)	
EMERGENCY PHONE: 800—523-9374 IN PENNSYLVANIA: 800—322-9092	CHEMICAL NAME AND SYNONYMS	Nitrogen	
ISSUE DATE AND REVISIONS 1 June 1978	FORMULA	N_2	CHEMICAL FAMILY Inert gas

HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE
Nitrogen is a simple asphyxiant and has no threshold limit value (TLV).

SYMPTOMS IF INGESTED, CONTACTED WITH SKIN, OR VAPOR INHALED
Nitrogen vapors in air may dilute the concentration of oxygen necessary to support life. Inhalation of high concentrations of gaseous nitrogen resulting in low oxygen concentrations can cause anoxia, resulting in dizziness, nausea, vomiting, or unconsciousness and death. Personnel should not be permitted to enter areas where the oxygen concentration is below 19% unless provided with self-contained breathing apparatus. Unconsciousness and death may occur without warning if the oxygen concentration is below approximately 8%. Contact with cold nitrogen gas or liquid can cause cryogenic (extreme low temperature) burns and freeze tissues.

TOXICOLOGICAL PROPERTIES
Nitrogen is a simple asphyxiant and constitutes 79% of the air we breathe. Nitrogen does not support life and may produce immediately hazardous atmospheres through the displacement of oxygen. Nitrogen under high pressure can produce narcosis even though oxygen sufficient for life is present.

RECOMMENDED FIRST AID TREATMENT
Persons suffering from lack of oxygen should be moved to areas with normal atmospheres. SELF-CONTAINED BREATHING APPARATUS MAY BE REQUIRED TO PREVENT ASPHYXIATION OF RESCUE WORKERS. Assisted respiration and supplemental oxygen should be given if the victim is not breathing. If cryogenic liquid or cold boil-off gas contacts a worker's skin or eyes, frozen tissues should be flooded or soaked with tepid water (105-115°F; 41-46°C). DO NOT USE HOT WATER. Cryogenic burns which result in blistering or deeper tissue freezing should be seen promptly by a physician.

FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used)	AUTO IGNITION TEMP	FLAMMABLE LIMITS	LEL	UEL
Nonflammable	N/A	N/A	N/A	N/A

EXTINGUISHING MEDIA	ELECTRICAL CLASSIFICATION GROUP
N/A	N/A

SPECIAL FIRE FIGHTING PROCEDURES
N/A

UNUSUAL FIRE AND EXPLOSION HAZARDS
N/A

DISCLAIMER

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Since the Company shall have no control of the use of the product described herein, the Company assumes no liability for loss or damage incurred from the proper or improper use of such product.

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PHYSICAL DATA

BOILING POINT (°F.) @ 1 atm.	-320.5°F (-195.8°C)	**FREEZING POINT (°F)** @ 1.82 psia	-346°F (-210.0°C)
VAPOR PRESSURE (psia) N/A		**SOLUBILITY IN WATER** 32°F, (0°C), 1 atm	2.3% by volume
VAPOR DENSITY (lb / cu ft) @ 70°F (20°C), 1 atm	0.07245	**SPECIFIC GRAVITY (AIR = 1)** @ 70°F (20°C), 1 atm	0.9669
LIQUID DENSITY (lb / cu ft) @ boiling point	50.46	**SPECIFIC GRAVITY (H_2O = 1)** @ boiling point	0.8

APPEARANCE AND ODOR
Both liquid and gaseous nitrogen are colorless and odorless.

REACTIVITY DATA

STABILITY Relatively Inert	**UNSTABLE**		**CONDITIONS TO AVOID**
	STABLE	XX	None

INCOMPATIBILITY (Materials to avoid)
None

HAZARDOUS DECOMPOSITION PRODUCTS
None

HAZARDOUS POLYMERIZATION	**MAY OCCUR**		**CONDITIONS TO AVOID**
	WILL NOT OCCUR	XX	None

SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Avoid contact of skin with liquid nitrogen or its cold boil-off gas. Flush liquid nitrogen spill with water to disperse. Ventilate enclosed areas to prevent formation of oxygen deficient atmospheres caused by the evaporation of liquid nitrogen or the release of gaseous nitrogen.

WASTE DISPOSAL METHOD
Allow liquid nitrogen to evaporate in a well ventilated outdoor location remote from work areas. Vent nitrogen gas slowly to a well ventilated outdoor location remote from work areas. Do not attempt to dispose of residual nitrogen in compressed gas cylinders. Return cylinders to Air Products with residual pressure, the cylinder valve tightly closed and valve caps in place.

SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (Specify type)
Use self-contained breathing apparatus in oxygen-deficient atmospheres. Caution! Respirators will not function. Use may result in asphyxiation.

VENTILATION Natural or mechanical where gas is present.	**LOCAL EXHAUST**	**SPECIAL**
	MECHANICAL (General)	**OTHER** Vents should be situated to avoid higher than normal concentration of nitrogen in work areas.

PROTECTIVE GLOVES
(LIN) Loose-fitting gloves of impermeable materials such as leather.

EYE PROTECTION
(LIN) Chemical goggles or safety glasses. Safety glasses are recommended when handling high pressure cylinders.

OTHER PROTECTIVE EQUIPMENT
None

SPECIAL PRECAUTIONS*

SPECIAL LABELING INFORMATION
Nitrogen shipments must be in accordance with Department of Transportation (DOT) regulations using DOT "NONFLAMMABLE GAS" label. Consult DOT regulations for details on the shipping of hazardous materials.

SPECIAL HANDLING RECOMMENDATIONS
Prevent contact of liquid nitrogen or cold boil-off gas with exposed skin. Prevent entrapment of liquid in closed systems. Use only in well ventilated areas. Compressed gas cylinders contain nitrogen at extremely high pressure and should be handled with care. Use a pressure-reducing regulator when connecting to lower pressure piping systems. Chain cylinders when in use. Never use direct flame to heat a compressed gas cylinder. Use a check valve to prevent back flow into storage container. Avoid dragging, rolling, or sliding cylinders, even for a short distance. Use a suitable hand truck. For additional handling recommendations on compressed gas cylinders, consult Compressed Gas Association Pamphlet P-1.

SPECIAL STORAGE RECOMMENDATIONS
Store liquid containers and cylinders in well ventilated areas. Keep cylinders away from sources of heat. Storage should not be in heavy traffic areas to prevent accidental knocking over or damage from passing or falling objects. Valve caps should remain on cylinders not connected for use. Segregate full and empty cylinders. Storage areas should be free of combustible material. Replace the cylinder cap when the cylinder is not in use. Avoid exposure to areas where salt or other corrosive chemicals are present. See Compressed Gas Association Pamphlet P-1 for additional storage recommendations.

SPECIAL PACKAGING RECOMMENDATIONS
Gaseous nitrogen containers meet DOT specifications or American Society of Mechanical Engineers (ASME) codes. Liquid nitrogen is stored in vacuum-insulated containers meeting DOT specifications or ASME codes.

OTHER RECOMMENDATIONS OR PRECAUTIONS
Liquid nitrogen is a cryogenic liquid. Materials of construction must be selected for compatibility with extremely low temperatures. Avoid use of carbon steel and other materials which become brittle at low temperatures.

*Various Government agencies (i.e., Department of Transportation, Occupational Safety and Health Administration, Food and Drug Administration and others) may have specific regulations concerning the transportation handling, storage or use of this product which will not be reflected in this data sheet. The customer should review these regulations to ensure that he is in full compliance.